

## Reaping Machines.

We present an abstract of a paper read before the British Association for the Advancement of Science, which recently met in England. The author of it is A. Crosskill, the favorite constructor of Bell's reapers, and perhaps the most extensive manufacturer of agricultural implements in England, it will be seen that—naturally enough—he awards the praise to Bells' Reaper. Leaving that opinion to the one side, as a historical document, the paper is valuable.

The application of machinery to reaping corn, excites at this time as much interest amongst mechanical engineers, as any subject to which their attention has of late years been directed. Upwards of 30 patents for reapers were taken out in England during the first six months of the present year, and we find amongst the patentees men of every degree, from Whitworth of Manchester, the first machine maker of the day, to country wheelwrights and blacksmiths.

A machine for reaping is mentioned by Pliny, as having been in use amongst the ancient Gauls, and we learn from Palladius that the body of the machine rested on an axle which connected two wheels. To this axle a pair of shafts were fixed, into which a steady ox was harnessed, not in the usual manner, but as a stable boy would say, with his head where his tail should be, consequently, when he walked on, instead of pulling by the shafts, he pushed by them, and drove the implement into the standing corn. The means adopted to cut and deliver it are not given with sufficient clearness to enable us to understand them; doubtless they were very primitive, but the fact of such a machine having been used by the Romans and Gauls is beyond doubt.

In 1812, the late Mr. Smith, of Deanston, brought out a reaping machine, which appeared at intervals with different modifications until the year 1835, when it worked very successfully at the meeting of the Highland Agricultural Society at Ayr. At that time, it consisted of a revolving cutter, 5 feet diameter, composed of thin steel segments bolted on an iron ring, and the gathering of the cut corn was effected by rakes, placed on an upright cylinder just above the cutter, which brought it off in a regular swath. The horses walked behind the machine, and were fastened to it by a pole or by shafts; in 1835 it was laid aside and not again brought forward.

In 1822 an attempt at reaping with a large circular cutter was made by a Mr. Mann, of Raby, in Cumberland, but unlike other inventors who had used the same form of cutter, he placed the horses before the machine, and they walked by the side of the standing corn, like the American reapers, brought to the Great Exhibition of 1851. This machine, like Smith's, was in existence for some years, but finally disappeared from public notice in 1832.

There is one more ancient reaper to which I would draw your attention on account of the great resemblance it bears to McCormick's Virginia Reaper, which attracted so much notice during the last two years. In 1822, a Mr. Ogle, of Rennington, near Alnwick, invented a reaping machine, which was worked upon wheat and barley, but as it received no encouragement only one was made. This machine was illustrated and described in the 5th Vol. of the "London Mechanics' Magazine" of 1826, and was in almost every important feature like McCormick's.

We need not be at a loss for an explanation of the failure of all these schemes, many of which possessed considerable merit. Until the last two or three years manual labor has been easily obtained in this country, and at harvest time especially a large number of Irishmen came over to England and obtained a livelihood by assisting farmers to gather in their crops.—Owing to the rapid increase of emigration, however, this temporary assistance becomes every year more and more precarious, and will in all probability entirely cease, and by a fortuitous coincidence, the demand for reaping machines thus occasioned, occurred at a time when public attention was directed to them, in consequence of the prominent position occupied in the Great Exhibition of 1851. Amongst the American contributions in the Crystal Palace,

were two reaping machines, one invented by McCormick, of Chicago, and the other by Hussey, of Baltimore, models of which I have on the table.

They are by no means the only reapers in use in the United States, the great demand in that country having called into operation numerous inventions for that purpose, but the two above mentioned are very extensively patronized. The annual sale of McCormick's machine amounts to about 1,500, and that of Hussey's from 800 to 1,000.

It will be seen in both cases that the horses draw the machines after them, and walk by the side of the uncut corn. In both also, the main wheel that carries the machine, gives a reciprocating motion to a bar which has double edged knives fixed upon it, and these knives pass between guards or fingers, against which the corn is cut. The shape of the knives and guards varies in both machines, as may be seen by the models. McCormick's cutters form an angle with the bar of from 20 to 30 degrees, and have their edges serrated. The cutting of these is very little assisted by the guards or fingers, but they have an action similar to a saw, and the slight inclination of the cutters prevents the corn from yielding as it might do from a straight knife. The cutter of the first machine brought by McCormick into the Great Exhibition, consisted of a straight serrated edge, but the knives with edges inclined both ways, are far superior to those originally used.

A reel or fan is employed to press the corn towards the cutter, and it is also useful to raise and collect that which is laid or which inclines from the machine.

The corn when cut falls upon a wooden platform, and a man riding upon the machine rakes it off at the side in sheaves or bundles.

The cutters used by Hussey, make an angle of 70 or 80 degrees with the bar, and are much more accurate than those used by his rival.—They are plain edged, and their action is to chop the corn between them, and the guards through which they pass. This form of knife is found objectionable here, from the soft and yielding nature of many of our English grasses and weeds, which, instead of being cut, bend through the guards, and in time choke up the knives. To obviate this, it has been found advisable to shorten and give them a serrated edge, similar to the improved ones used by McCormick; and it is very remarkable that both Hussey's and McCormick's cutters, which differed so widely when first brought by their respective makers into this country, have given place to a very similar knife, which is now used in both machines.

Hussey's machine has no fan or reel, but a man rides upon it in such a position, that he can, by using a rake, bring against the cutters that corn which lies away from them and requires his assistance. When cut it falls upon a platform, and after a sufficient quantity to form a sheaf has accumulated, the man pushes it off with his rake.

These two machines have been repeatedly tested, both in this country and in the United States. At the Great Exhibition of 1851, the Council Medal was awarded to McCormick.—Mr. Hussey not being in this country, and having no one to exhibit his machine in action, did not receive a similar honor.

In the September of that year, he arrived in England, and by working his machine in competition with McCormick's before practical farmers, he obtained for it a large share of public approbation. In 1852, Hussey's machine was victorious at the meeting of the Royal Agricultural Society at Lewis, and at various trials of less importance, while McCormick's carried off the prize at the Great Yorkshire Agricultural Society at Sheffield and achieved other victories.

Both machines have, however, been defeated at every trial this season, by a third candidate, which I shall now proceed to describe.

In the year 1826, the Rev. Patrick Bell, now minister of Carmylie, in Forfarshire, invented and constructed a reaping machine, and succeeded in making it work so well, that in the year 1829 the Highland Agricultural Society awarded to him the sum of £50 for his invention. During that and the following years,

above a dozen were made in and about Dundee, and some of them used by practical farmers, but the redundancy of manual labor, coupled with the difficulty of keeping in order machines of a somewhat complicated character operated so decidedly against their use, that most of them were gradually laid aside. Mr. George Bell, the brother of the inventor has, however, persevered in working the machine, and has had one in use every year since 1830, by which he has obtained great experience, and become thoroughly acquainted with the various obstacles to be encountered in the harvest field.—In 1852 when the American reapers were sent northward, Mr. Bell put his old machine into thorough repair and met Hussey's at the meeting of the Highland Society at Perth.

The judges unanimously awarded the prize to Bell's machine. This machine is different from both the Americans, and for novelty of invention, no resemblance exists between it and any other that had been made, except that the horses follow the machine, a mode of propulsion which, as we have seen, was in use at the time of the ancient Romans.

The cutting is performed by a series of shears or scissors, each moving blade being double edged and cutting both ways.

As the corn is cut, it is pressed back by the revolving reel upon the canvas, which has a rapid motion sideways, and which turns it off in a continuous swath. The canvas is inclined at a considerable angle, and the corn in falling turns partially over, so that the heads lie all one way, with great regularity.

The horses walk behind the machine, and propel it by means of a pole passing between them, to the extremity of which they are yoked; a man walks after them, and by means of this pole, guides the implement. By bevel wheels the canvas may be reversed so that the corn can be delivered on either side of the machine. The machine cuts a width of full six feet.

In acknowledging our debt of gratitude to the Americans for bringing over their machines, and directing public attention to the subject, and also for demonstrating in a manner that must have convinced the most sceptical and prejudiced, that reaping by machinery was as practicable as threshing, it must be a source of national pride to find that we had in Great Britain, an implement equal to any brought from foreign countries, and which only required an opportunity to be fully appreciated.

There is one more ingenious invention which we owe to our transatlantic brethren, namely, Atkin's automaton or self-raking reaper. This was brought over last autumn, and exhibited in motion at the Polytechnic Institution, London. The horses go before the machine, and the corn is cut and delivered on to the platform by a reel similar to McCormick's, but instead of being drawn off by a man, a rake with an action similar to the human arm, gathers up the cut corn, and deposits it on the ground in sheaves. This invention was tried at the meeting of the Royal Agricultural Society at Gloucester this year, and failed, not from any defect in the delivery, but owing to the inefficiency of the cutting apparatus, which had not been tried before it was taken into the field. Being in the hands of such men as the Messrs. Ransomes, of Ipswich, no doubt its capabilities will be developed.

## Ink for Steel Pens.

Take twenty lbs. of the best Campeachy logwood, and boil it down for three hours in one gallon of water, taking care to add enough during evaporation, so as to have one gallon of liquor at the end of the boiling. Into this, dissolve 12 oz. of the chromate of potassa, and stir well. It should then be bottled up for use. It does not require gum to hold any sediment in solution—for there is none—like the common inks, made with the sulphate of iron, logwood and galls, or sumac. As there is no acid in this ink, it is the very writing fluid required for steel pens.

## Gas from Rosin Oil.

A patent was granted on the 2nd of last September, to Alexis Robitaille, of Quebec, tinsmith, for a new and improved apparatus, and method of working, for obtaining and producing gas, for the purposes of illumination, from

rosin and oil, and other substances of like nature, and from the decomposition of water.

## Delays of Legal Business in England.

We have received from our intelligent correspondent in London, a letter, from which we extract the following:—"Our legal officers are so slow, together with the long vacation, that we are much annoyed by the disappointment of not being able to send you the parcel by this packet as we had intended. It is no use to find fault with the clerks or officials, the evil is in the system and cannot be changed otherwise than by introducing a better one. Would you believe that for three months in the year the law offices are considered closed, the only attendants being a few overpaid clerks, who consider themselves martyrs to their country in being required to call at their offices an hour or two daily; and all this in addition to frequent holidays, varying from one to six or seven days. The Lord Chancellor is one of the Patent Commissioners, he has charge of the Great Seal, which is supposed to be always in his keeping, consequently, if my Lord goes into the country, and a patentee should have run pretty close to his time for sealing, we have to send a special messenger after him to get a seal, at an extra charge of £3 3s. Is it not abominable that the business of the country should be so clogged. Perhaps in the course of a week (please my Lord) we may be able to forward you a parcel, but do not rely upon it until you receive our assurance that it has actually gone.

A strike has taken place here against the sewing machine, which we suppose will end pretty much as such affairs generally do, to the discomfiture of the turn-outs."

From the picture presented above, we do not wonder at the story told of a couple who grew grey while waiting for the English courts to decide whether they had a right to get married. Only think of posting a messenger through the country to hunt up my Lord, who is perhaps shooting pheasants in the Highlands of Scotland, in order to obtain a seal to any public document! And by the by 'my Lord' must have a capacious pocket if he carries those seals with him, for they are as large as the crown of your hat, and as clumsy as that of a New York Dutchman in the days of Deidrich Knickerbocker. The delays are had enough in our Patent Office, but we can't hold a candle to John Bull in that line. But seriously, we do not wonder at the demand for law reform which is now made in England. The only wonder is that the people submit to it at all. Americans residing out of New York City, never would do this.

## Prize for a New Invention.

Moses S. Beach, the publisher and proprietor of the "New York Sun," with his accustomed liberality to inventors, offers a prize of \$1000 to any person who will invent a feeding apparatus for his Mammoth Press that will feed in 3000 sheets per hour to every one of its eight cylinders; he also offers \$10,000 for the patent of such an invention. The offer therefore, for the invention is \$11,000, and will be open to our inventors until the 1st of January, 1855.

The circulation of the "Sun," it is stated, has become so large that an invention of this kind is demanded, as the hand-feeders cannot exceed 2000 per hour each. It is desired that an edition of 120,000 of the "Sun" should be printed in five hours.

## Public Amusements.

As many of our readers are visiting the city at the present time, they would perhaps be glad to be informed of some of the places of public amusement most in accordance with their tastes. Besides the theatres, and among the less objectionable places of public resort, we would name the following:—Banvard's Georama of the Holy Land, No. 596 Broadway; Frankenstein's Panorama of Niagara, 718 Broadway; Powell's National Painting, "De Soto Discovering the Mississippi," 663 Broadway; Perham's Mirror of Niagara, Ontario, and the St. Lawrence, 539 Broadway; and at the Stuyvesant Institute, besides Signor Blitz, may be found the gallery of Egyptian Antiquities, and a portrait of Charles I., supposed to be the long lost Velasquez. At Barnum's American Museum, in addition to the other curiosities, are two beautiful specimens of living giraffes.